STATUS OF THE ELECTRICITY SECTOR

The initial U.S. reconstruction goal for the electricity sector was to increase generation to 6,750 megawatts (MW)[43] by the summer of 2004, from a pre-war level of 4,500 MW.[44] After the establishment of IRRF 2 in November 2003, the goal shifted to 6,000 MW by June 2004. The goal has remained 6,000 MW since then.[45]

The U.S. Department of Energy (DoE) reports that Iraq has a 2010 generation capacity goal of more than 18,000 MW, which will be needed to meet a peak demand of nearly 15,000 MW.[46] U.S.-funded electricity projects also include activities to boost transmission and distribution capabilities.

Despite reprogramming that reduced the sector by $1 billion, electricity received the second-largest allocation ($4.24 billion) of IRRF dollars (see Figure 2-7). At the end of this quarter, 75% of planned IRRF-funded projects were complete, and 77% of the allocated dollars were expended.[47]

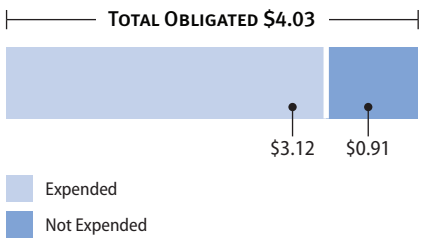
U.S.-funded Results on Generation, Transmission, and Distribution

Iraq's electricity sector suffers from aging and poorly maintained infrastructure; more than 85% of Iraqi power plants are at least 20 years old. In an effort to boost capabilities, the U.S. reconstruction program funds three major types of projects in the electricity sector:

- *Generation* facilities produce power for the system.
- *Transmission* networks carry that power across the country.
- *Distribution* networks deliver the transmitted power to local areas, homes, and businesses.

Protecting the linear infrastructure in the electricity sector remains a challenge across Iraq.

Figure 2-7
STATUS OF IRRF 2 FUNDS - ELECTRICITY
$ Billions
Source: DoS, *Iraq Weekly Status* (3/27/2007)



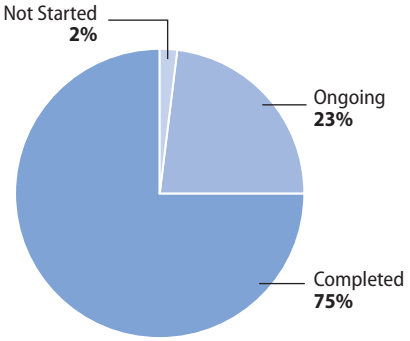
To date, 402 U.S.-funded projects have been completed. For the status of electricity projects by subsector, see Figure 2-8.[48] All remaining U.S.-funded generation projects will be finished by September 2007, except the computerized maintenance management system (CMMS), which is scheduled to be completed in April 2008.[49] However, O&M allocations by the GOI continue to limit the sustainability of U.S.-funded projects as responsibility is transferred to Iraqi operators.[50]

GENERATION FACILITIES

This quarter, the average daily power generation on the grid was 3,832 MW,[51] which is below reported pre-war levels (4,500 MW). Actual peak production is less than the total capacity partly because of planned and unplanned maintenance.[52]

The outputs of U.S. electricity projects are measured by the generation capacity added to the grid in MW. U.S. projects have contributed 2120 MW[53] to Iraq's generation capacity. Table 2-8 and Figure 2-9 compares the pre-war levels with the U.S. goal set in November 2003 and this quarter's average.

Figure 2-8
STATUS OF IRRF 2 PROJECTS - ELECTRICITY
Sources: IRMS, *IRMO Rollup* (3/30/2007); USAID, *Activities Report* (4/10/2007)



Project Type	Not Started	Ongoing	Completed	Total
Distribution	7	88	330	**425**
Transmission	2	30	24	**56**
Generation	2	1	48	**51**
Automatic Monitoring and Control System		5		**5**
Total	**11**	**124**	**402**	**537**

Current Electricity Generation Capacity vs. Pre-war Level (megawatts)

Output Metric	Pre-war Level, as of March 2003	U.S. Goal	Quarter Average
Generation Capacity	4,500	6,000	3,832

Source: Pre-war level: UN/World Bank *Joint Iraq Needs Assessment*, 2003, p. 28.
Note: GAO recently reported the pre-war level as 4,300 MW (GAO Report 06-697T, April 25, 2006, p. 19).
Goal: GRD response to SIGIR, March 27, 2007.
Current Status: IRMO, *Weekly Status Reports*, March 27, 2007.

Table 2-8

Figure 2-9
Current Electricity Generation Capacity vs. Pre-war Level
Megawatts (MW)
Source: U.S. Iraqi Goal: GRD, Response to SIGIR (3/27/2007)

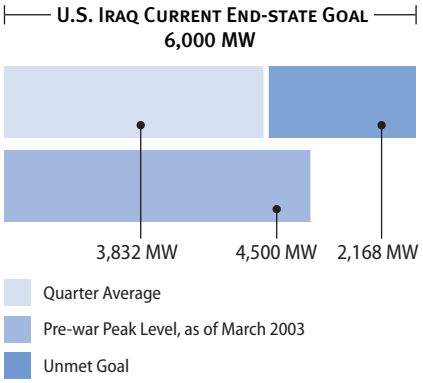
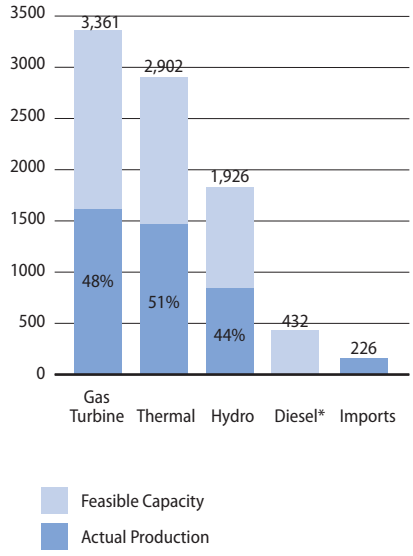


Figure 2-10
Actual Production vs. Feasible Electricity Capacity
Megawatts (MW)
Source: IRMO, *Daily Electricity Report* (1/1/2007 - 3/31/2007)



*Diesel power produced less than 1% of the total feasible production.

Demand for electricity continues to outpace generation capacity, and operations at power plants continue to lack sufficient quantities of refined fuel to run generators at peak capacity. This quarter, insufficient supplies of fuel and water to generation facilities led to a loss of nearly 1,500 MW in production per day. As new generation projects come online, the issue of fuel and water supply grows more critical.[54]

As Figure 2-10 demonstrates, 52% of feasible capacity at gas turbine facilities that produce electricity goes unmet. Gas turbine plants lose approximately 1,800 MW of production per day because heavy fuel oil is used instead of natural gas.

TRANSMISSION NETWORKS

Twenty-four IRRF-funded transmission projects have been completed to date, 30 are in progress, and 2 have not started.[55] Sabotage of feeder lines continues to limit the impact of U.S.-funded projects by reducing the hours

Current Outcomes vs. Pre-war Levels and Goals

Outcome Metric	Pre-war Level	Iraq Goal for July 2006	Daily Average, Last Week of March 2007
Iraq Hours of Power/Day	4-8	12	14
Baghdad Hours of Power/Day	16-24	12	6.5

Sources: Pre-war level: DoS Briefing by U.S. Embassy Baghdad, November 30, 2005; Goals: Joint U.S.-Iraqi Electricity Action Plan, March 12, 2006, p. 2.; Current Status: IRMO Weekly Status Reports, January - March 27, 2007.

Table 2-9

of power that Iraqis receive in their homes and businesses.[56] As a consequence, Baghdad continues to struggle with little government-produced power.

Transmission construction on overhead lines and substations continues at a sporadic pace, as 132 kV substations were started in Samarra, Salah al-Din, South Sulaymaniyah, Babil, Fallujah, Dahuk, and Nassriya. Planned substation work at Farbi and Jamila in Baghdad, East Diwaniya, Basrah, Ramadi, Dahuk, Hilla South, and Thi Qar did not start because of contractor and security issues.[57]

DISTRIBUTION NETWORKS

Distribution projects are crucial to bringing generated power into Iraqi homes. This quarter, the remaining 88 of 425 programmed projects are in progress.[58]

Distributing power from generation facilities to Iraqi homes remains a major challenge. Specifically, Baghdad continues to receive fewer hours of power than the rest of the country (averaging around 6.5 for the last week of March) because of attacks on power lines that feed the capital and the inability to transfer power to the capital from large plants in northern and southern Iraq.

This quarter's hours of power show a slight decrease from the same period in 2006, when Baghdad received 8 hours of power for the spring quarter. Baghdad has never had enough power plants to meet its own needs without importing power from other regions, and building new power plants is part of the GOI's long-term generation plan.

Outside Baghdad, the measure of hours of power (average of 14 hours per day for the last week of March) is greater than before the U.S.-led invasion and roughly the same as it was during this quarter last year.[59] Daily electricity demand in Baghdad averaged approximately 1,800 MW this quarter.[60] For the hours of power available to Iraqis compared to pre-war levels, see Table 2-9.

Demand for electricity continues to surpass Iraq's peak generation—8,533 MW demanded on average this quarter, compared to a peak generation output average of 3,832 MW.[61] See Figure 2-11.

Figure 2-12 shows the average daily load served this quarter compared to the established goal of 110,000 megawatt hours (MWh). GRD notes that average daily load served is a better measure of how much power is produced for the national grid because it measures generation over a period of time rather than the peak produced during the day.[62] During this quarter, the daily load served averaged 78,048 MWh, compared to 90,614 MWh last quarter and 88,455 MWh a year ago at this time.[63] The pre-war level was 98,000 MWh.

Figure 2-11
ELECTRICITY DEMAND VS. AVAILABLE CAPACITY
Monthly Average Megawatts (MW)
Source: IRMO, *Weekly Status Reports* (12/14/2005 - 3/27/2007)

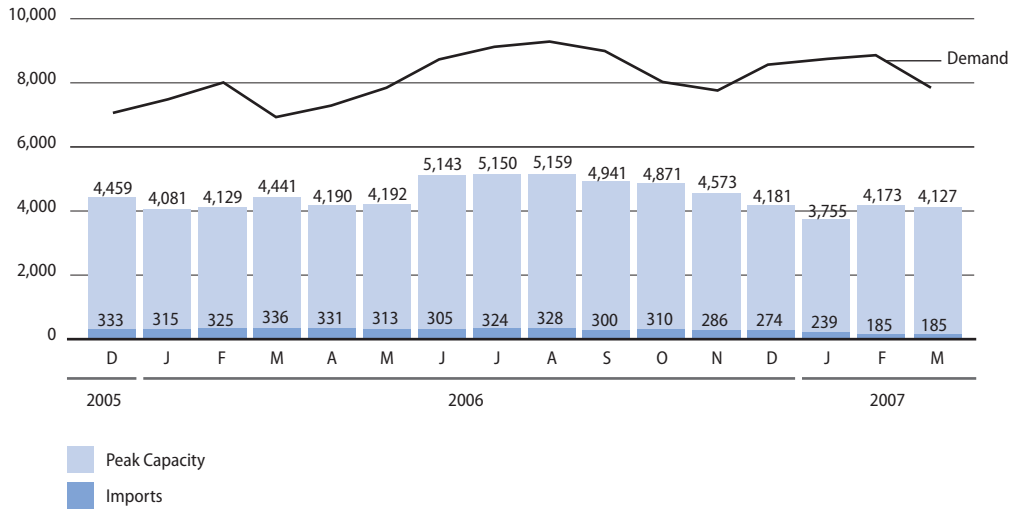
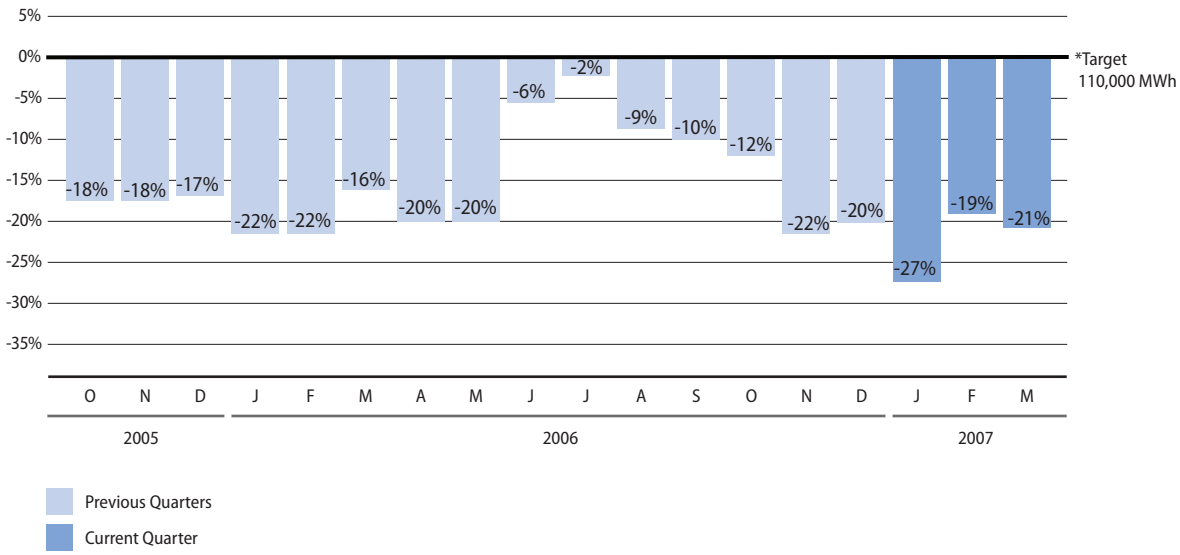


Figure 2-12
ELECTRICITY LOAD SERVED
Monthly Average Electricity Load Served, Megawatt Hours (MWh)
Source: IRMO, *Weekly Status Reports* (9/28/2005 - 3/27/2007)



* Target is a constant based on a goal set in summer 2005.